Apr 21st, 9:00 AM - Apr 22nd, 4:45 PM

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Introduction

- Gelatinous and soft-bodied zooplankton (GZ) are traditionally considered as ‘trophic dead ends’ (Hansson & Norman 1995)
- Due to their low energy contents per wet weight, GZ have been named ‘green tea of the sea’ (Hamilton 2016)
- There is growing awareness of importance of GZ in marine food webs (Hays *et al.* 2018) and for various other non-energetic purposes (Thiebot & McInnes 2020)
- Database listing elemental composition, organic and energy contents of various taxa is scattered, incomplete, and superficial in many cases
- We aim at the establishment of a comprehensive region-wide database compiling these data for a wide range of GZ species to inform energy-based food web models

Methods

- For best describing the nutritional value of food items, a combination of several proxies is recommended (Chen & Li 2017; Machovsky-Capuska & Raubenheimer 2020)
- More than **1000 specimens** from **33 GZ species** were collected on **10 cruises** between **2014 and 2019** in the Salish Sea and adjacent waters (Figs. 1 and 2)
- Samples have been collected with Bongo and dip nets, Multinet, and pelagic trawl (Fig. 3)
- Specimens were sized and frozen on board and freeze-dried in the laboratory
- **Elemental composition (C, N)** was determined in elemental analyser
- **Organic content** measurement is based on dry matter (500 °C, 24 h)
- **Energy content** was estimated via published conversion factors (Platt *et al.* 1969; Schneider 1988) and based on bomb-calorimetry

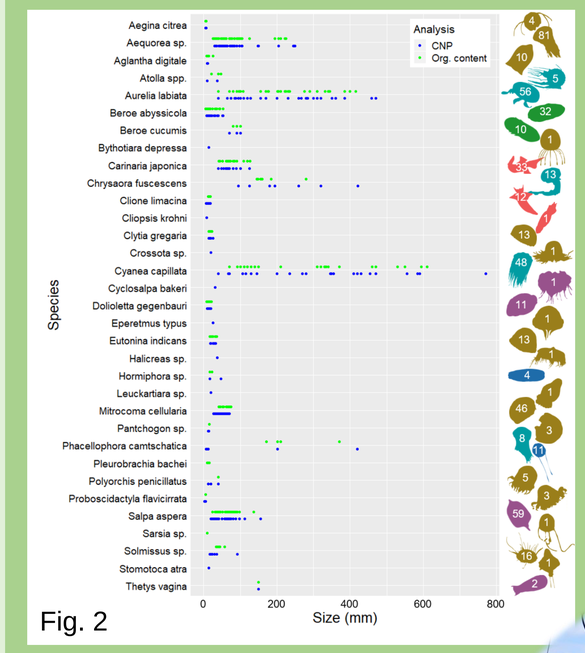
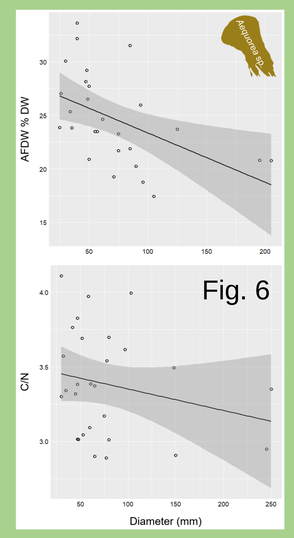


Fig. 2



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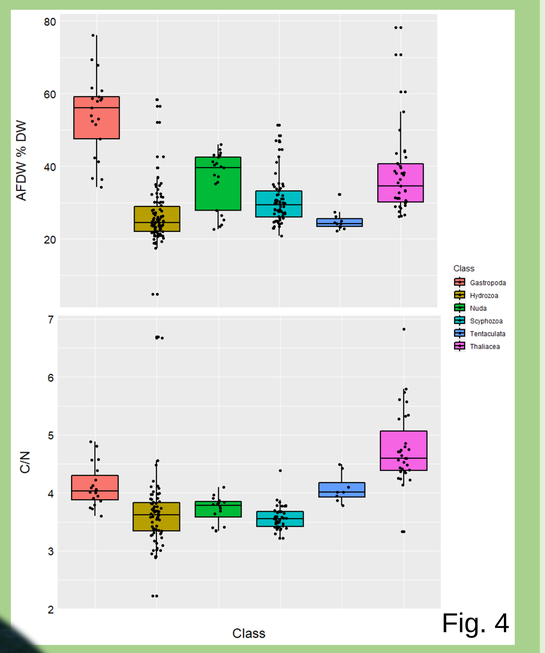

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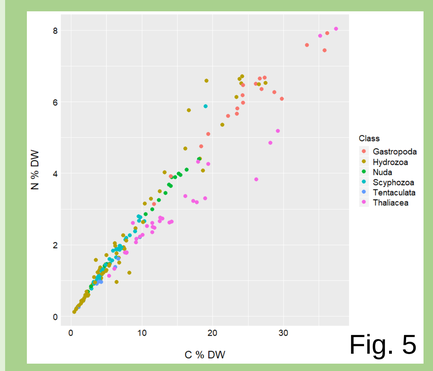

Fig. 5

Fig. 3

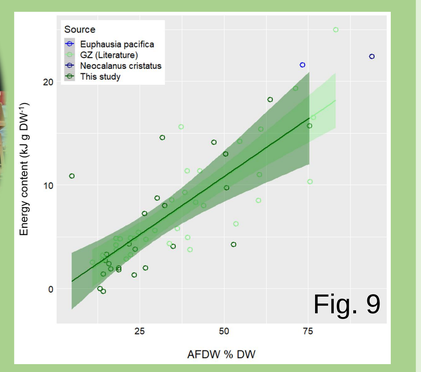

Fig. 9

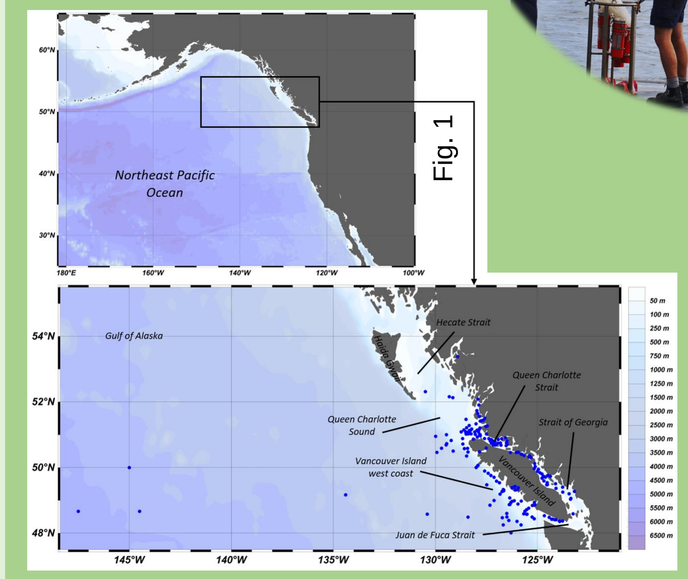

Fig. 1

Fig. 8

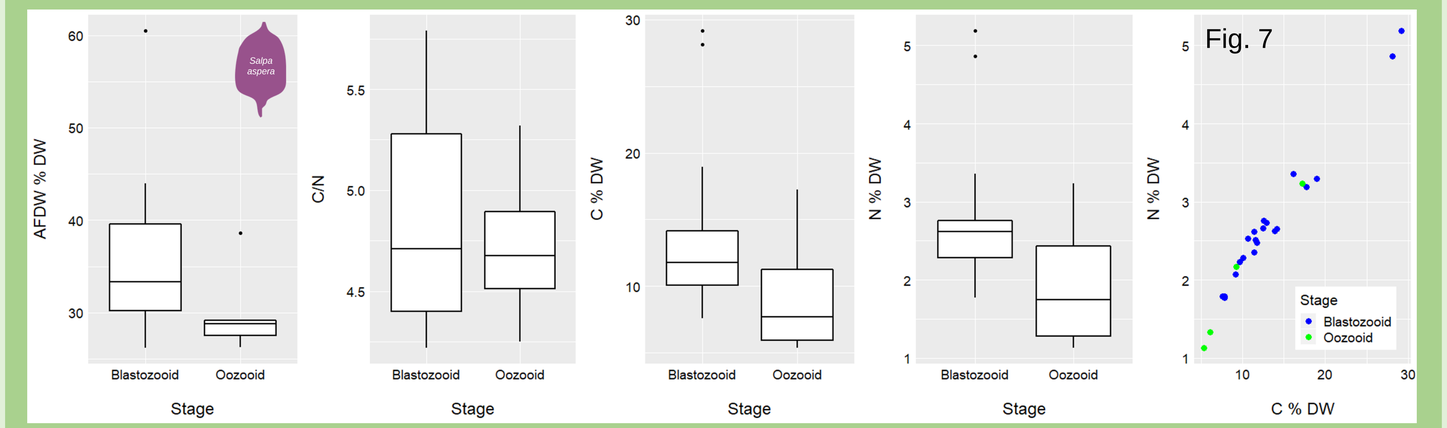

Fig. 7

Results

- Only a **set of net types with different mesh sizes** allows for huge species sampling variety in near and offshore areas in the present study
- **Marked and partly statistically significant differences** in **organic content** and **C/N ratio** among classes (Figs. 4 and 5) were identified
- Both depend highly on **sampled size range** (Fig. 6, e.g. *Aequorea* sp.) and **development stage composition** (Fig. 7, e.g. *Salpa aspera*)
- **Energy contents** vary between **< 0.1 and 22.8 kJ g DW^{-1}** depended on class and method used (Fig. 8)
- Energy contents resulting from **bomb-calorimetry** are always low compared with conversion-used values
- **Organic content/energy content** pattern (based on Platt *et al.* 1969) highly similar to other GZ, but lower than values published for crustaceans (Fig. 9)

Discussion

- ‘**Hidden diversity**’ in GZ in terms of organic and energy contents and elemental composition, which needs to be considered when used in food web models
- Size- and development stage dependency are considerable
- **Bomb-calorimetry** failed to confirm energy contents based on conversion factors; questioning either technique or validity of used conversions
- **Species-level diversity** is even bigger, but not shown here for clarity reasons
- Even if GZ have low energy content compared to crustaceans, **GZ and taxonomic variety** should not be neglected in nutritional studies

Future Research

- Continuation of sample analyses from **cruises in 2020** is planned
- **Seasonality**, **various tissues**, **parasites**, and **further life cycle stages** are not considered yet
- Analysis of **phosphorus**, **vitamin**, and **micronutrient** contents is recommended
- Other gelatinous species of e.g. **siphonophores**, **polychaetes**, and **radiolarians** need to be analysed

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Acknowledgements

- Captains and crews of *CCGS J.P. Tully*, *CCGS W.E. Ricker*, *F/V Sea Crest*, and *R/V Professor Kaganovskiy*
- Stephen Healy, Sander Holthuijsen, Henry Lam, Maureen Soon, and Lian E. Kwong for assistance with laboratory work

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